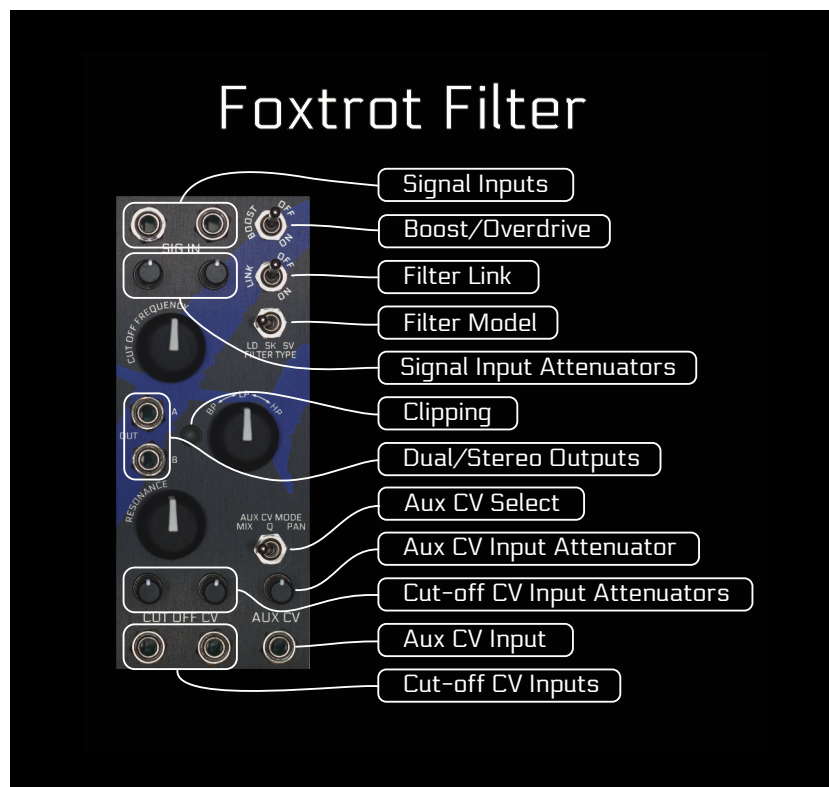


Foxtrot User Manual

Foxtrot has four identical Voltage Controlled Filter channels. Although they can be linked for some interesting effects, let's start by looking at a single filter channel.



1. Basic Operation

Each channel has two mono signal inputs. The two inputs are summed together before being sent to the filter, with the attenuation of each input being set by the corresponding input trim pot.

There are two cut off frequency CV inputs per VCF channel, each with its own attenuator control. The CVs are summed to form the CV controlling the VCF. A CV input of 0V or below corresponds to the lowest cut-off. If you want to use a bipolar signal to modulate the VCFs (for instance, from an LFO), just turn up the manual cut off frequency knob.

There are two identical outputs from each filter channel, however, selecting Pan as the Aux CV input turns the two outputs into a stereo pair, with the pan now controlled by Aux CV.

1.1 CUT OFF FREQUENCY CONTROL

Unsurprisingly, the Cut Off Frequency knob controls the static cut off of the filter. Fully anticlockwise is the lowest frequency (around 20Hz) and fully clockwise is the highest (around 20kHz depending on the filter model).

1.2 FILTER TYPE SWITCH

Each Foxtrot channel has a choice of three virtual analog filter models.

Setting the Filter Type switch to LD selects a Moog style 4th order ladder filter.

The SK setting selects a 2nd order 'Sallen-and-Key' filter based on the Korg 35 analog module used in early Korg synthesizers.

SV is a State Variable filter similar to the Oberheim SEM filter.

1.3 BP<-LP->HP CONTROL

Each filter type can be continuously varied from Band Pass through Low Pass to High Pass using this control, extending the capabilities of the original analog designs on which the Foxtrot filters are based.

There is a detent at the LP position so that you can be sure the response is truly just low pass. As with the Oberheim SEM, a setting half way between Low Pass and High Pass gives you a notch filter.

1.4 RESONANCE CONTROL

This controls the filter Resonance – sometimes called Q, Peak, or Emphasis. At high Resonance settings, the LD and SK filters will self-oscillate. The SK filter is particularly keen!

1.5 BOOST SWITCH

The classic analog filter designs that Foxtrot models have various sources of non-linearity – in other words, bits of circuit that don't behave perfectly, introducing distortion to the audio signal. The Moog ladder filter has gentle distortion in each of its ladder 'rungs'. The Korg design actually has a diode based clipper – similar to the circuit in guitar fuzz pedals. Much of the character of the filters come from these imperfections.

Foxtrot accurately mimics these non-linearities and includes a Boost switch, to overdrive the filters for even more distortion. Note that overdriving filters tends to decrease the effect of resonance. Foxtrot compensates for this effect (to some degree) by increasing the maximum resonance when Boost is enabled.

1.6 CLIPPING LED

With high audio input levels – particularly if you are using both inputs – and with some filter settings, it's possible for the filter to exceed the output level possible in Eurorack, so a soft-clipping circuit is included in each output. When the circuit is active, the Clipping LED illuminates. Unless you like the effect (!) you can reduce the clipping by turning down the audio inputs using the attenuator knobs.

1.6 AUX CV MODE SWITCH

The AUX CV input can be selected to control one of three filter functions.

When set to MIX the AUX CV controls the sweep from band pass to low pass to high pass. A 0V CV input corresponds to low pass, negative CVs sweep the response towards band pass,

positive CVs sweep towards high pass. The BP<-LP->HP control is still active in this mode, with the CV acting as an offset to the knob setting.

When set to Q, the AUX CV controls filter resonance. Again, the CV acts as an offset to the physical Resonance control, positive CVs increasing resonance and negative CVs decreasing it.

When set to Pan, the AUX CV turns the two filter outputs into a stereo pair. A positive CV pans the signal towards the A output, a negative CV towards the B output.

2. Linked Operation

Enabling the Link Switch on two or more filter channels links those channels together.

The audio inputs of all linked channels are summed together.

Similarly, the audio outputs of all linked channels are summed together and fed to all their outputs – so every linked channel outputs the same audio.

The cut off frequency of each linked channel is the sum of its own cut off, and the left-most channel, so you can set each filter to its own cut off and then sweep them all together using the left-most channel.

This function is particularly effective with multiple band pass filters, as you can tune each filter to a different centre frequency and then sweep them all together using the left-most cut off CV and/or control.

The Pan CV of the leftmost channel will control any filter which has the AUX CV set to Pan.

Specifications

Width: 38HP

POWER CONSUMPTION

+12v: 250mA

-12v: 100mA

+5v: 0mA

Inputs:

Signal [Zero attenuation]: $\pm 5\text{v}$ nominal, $\pm 12\text{v}$ max

Cut Off CV [Zero attenuation]: 0-5v nominal

Aux CV [Zero attenuation]: $\pm 5\text{v}$ nominal

Outputs:

Dual/Stereo: $\pm 10\text{v}$

Important Safety Instructions

Correct disposal of this product:



This symbol indicates that this product must not be disposed of with household waste according to WEEE Directive (2012/19/EU) and your national law. This product should be taken to a collection centre licensed for the recycling of waste electrical and electronic equipment (EEE).